

Models of marine birds

“Understanding effects of changes on marine bird populations”

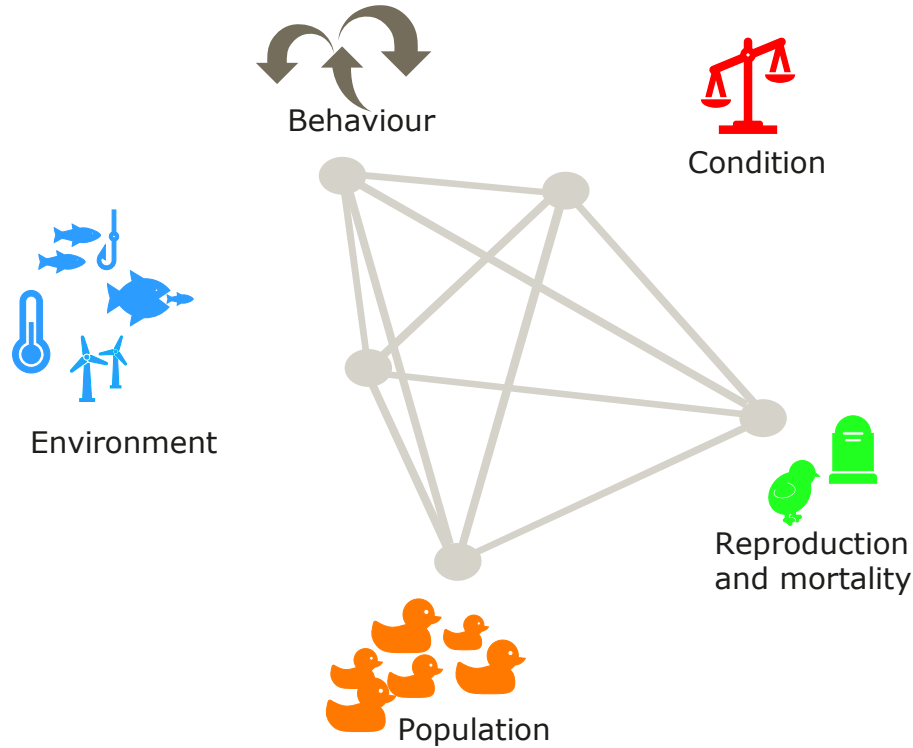
Floor Soudijn, Tobias van Kooten, Silke van Daalen, Vincent Hin, Eleni Melis, Daniel Benden, Astrid Potiek, Abel Gyimesi, Gerben IJntema



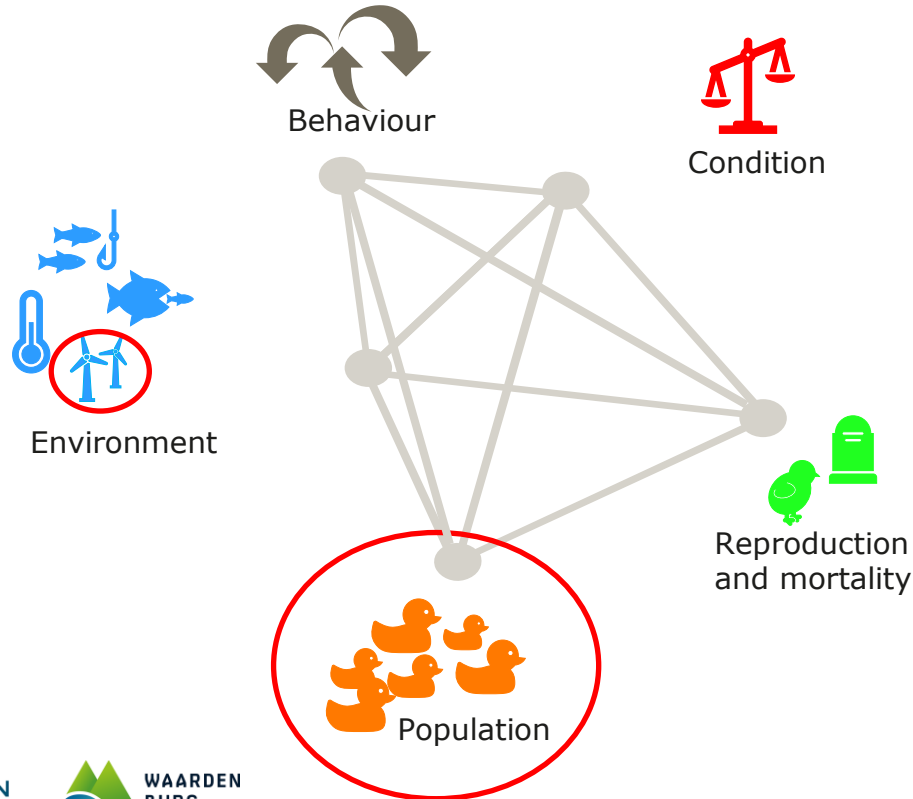
Effects of ..

- Collisions with offshore wind turbines
- Habitat loss due to avoidance of offshore wind areas
- Ecosystem effects
- Cumulative effects

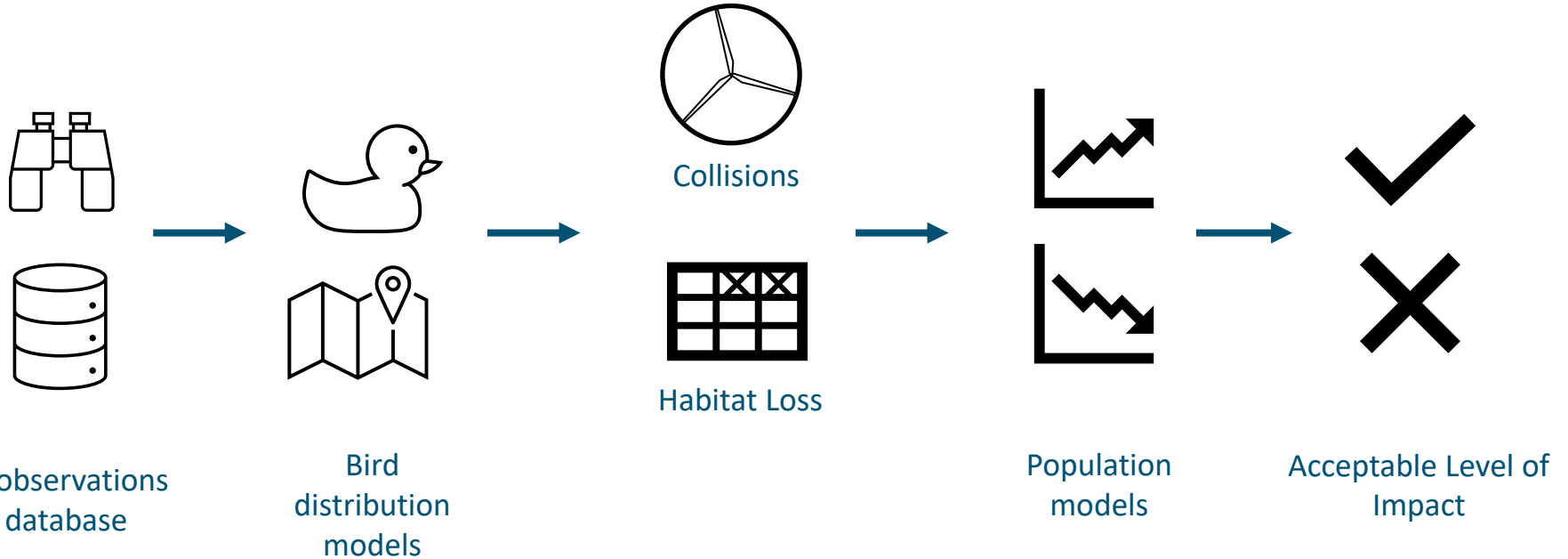
Effects on the....



WOZEP – quantification of population level effects



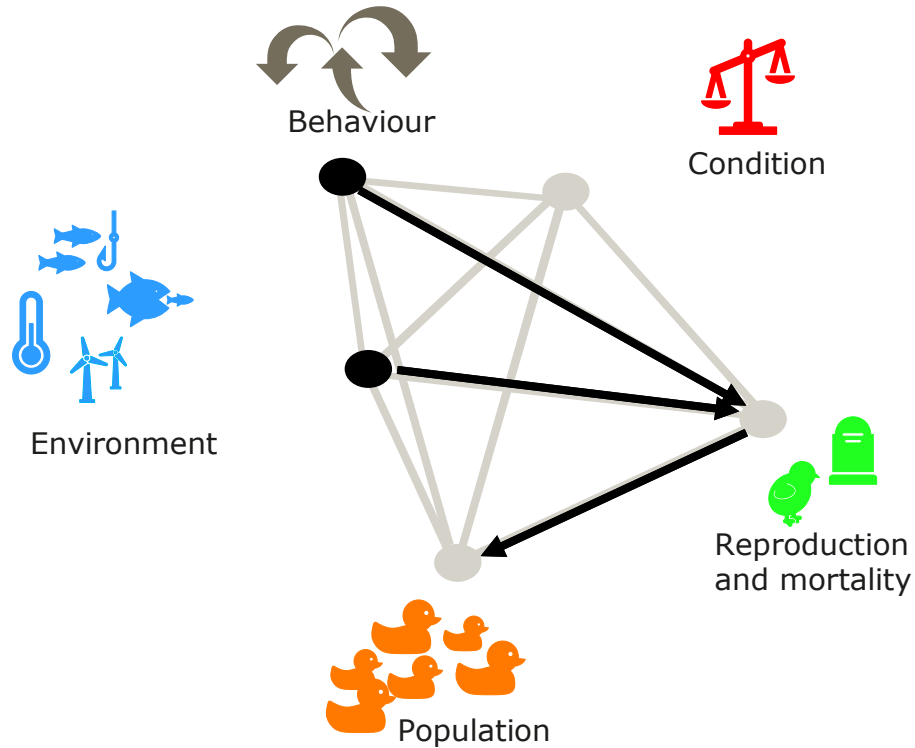
Overview of assessment methodology KEC (WOZEP)



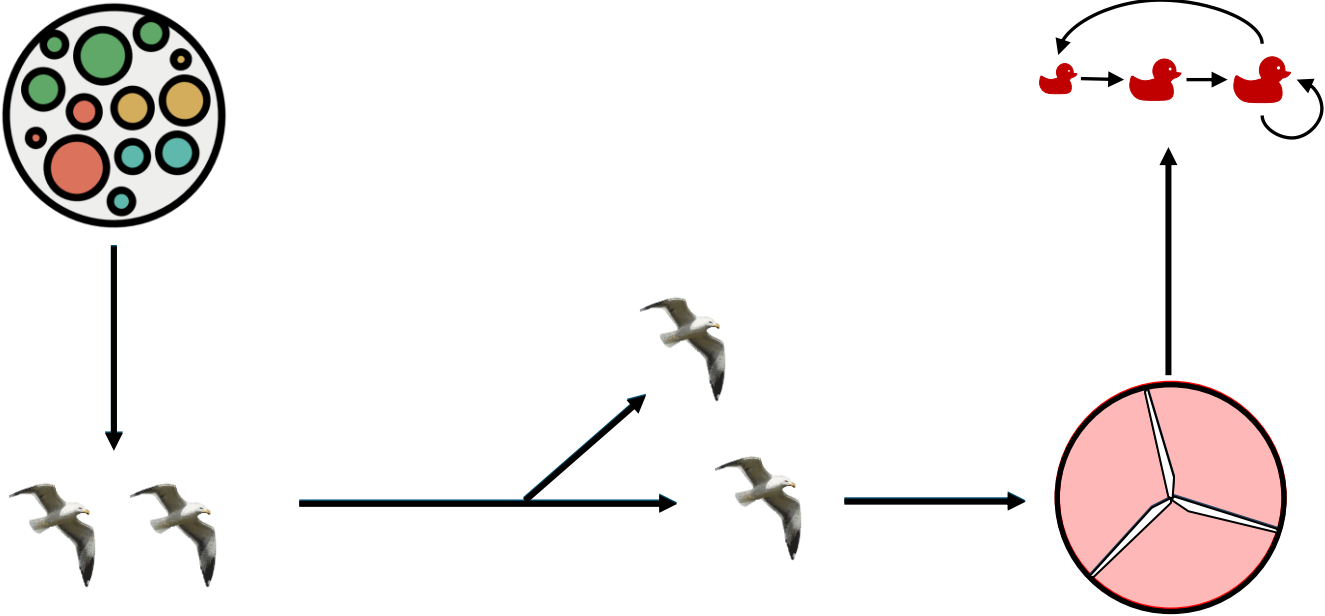
Collisions with offshore wind turbines



Effects on the....

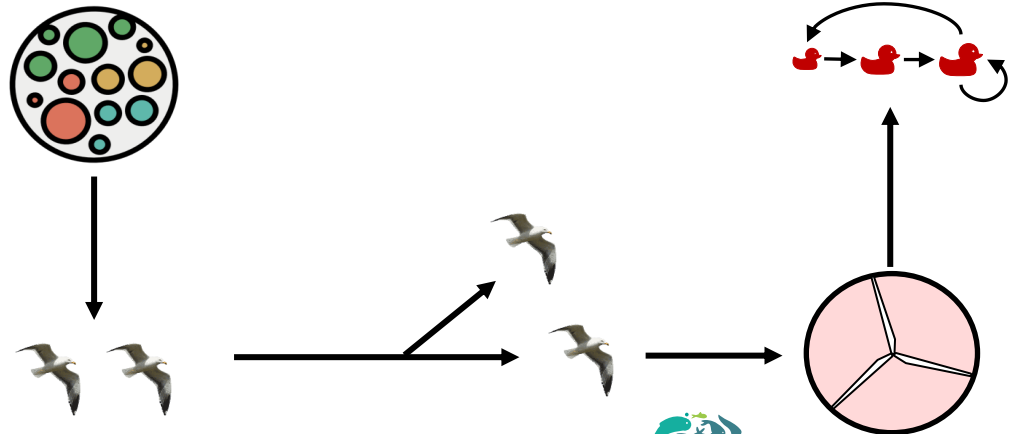


Stochastic collision models (KEC)

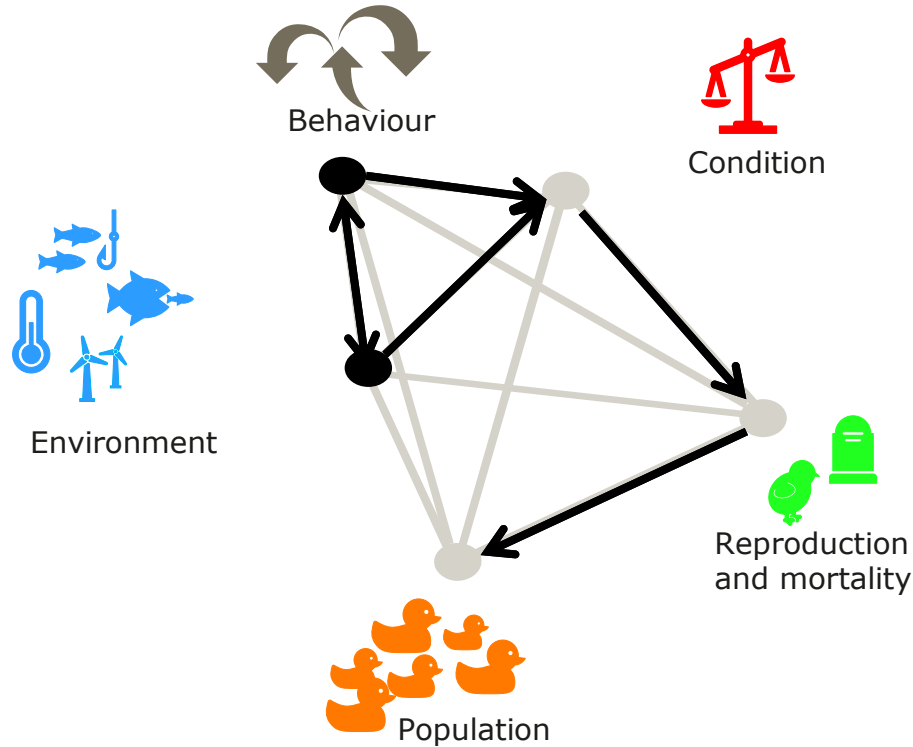


Some highly variable/uncertain & high effect factors

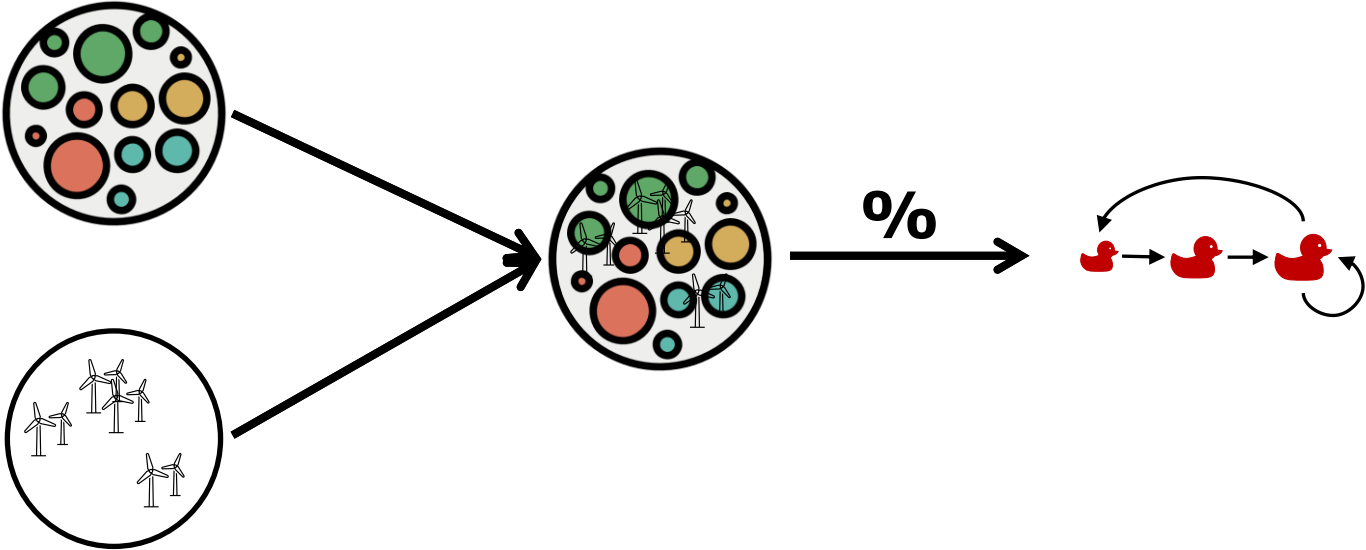
- Local density -> number of flight movements
- Part of the flight movements at the height of the rotor
- Avoidance



Effects on the....



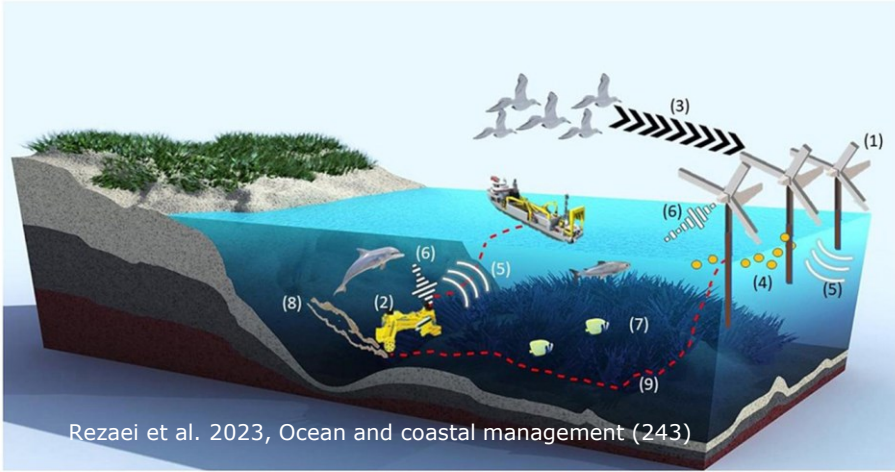
Overlap analysis (KEC)



Simplification of reality

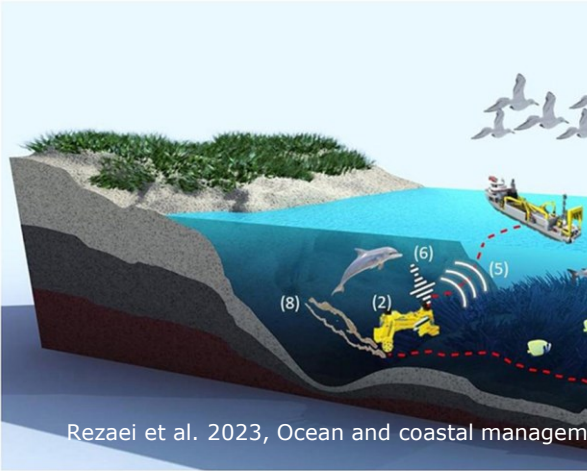
- Birds continuously move
- Effects built up over time (mortality percentages currently used are very uncertain)
- Ecological and energetic processes determine effects, which also depend on local densities
- In development: HALOMAR
 - Individuals
 - Energy budgets
 - Spatial food availability

Ecosystem effects



- (1) Offshore wind farm
- (2) Trenching machine
- (3) Collision risk (bird mortality)
- (4) Chemical release
- (5) Electromagnetic field
- (6) Noise pollution
- (7) Artificial reef effect
- (8) Turbidity plum and sediment transportation
- (9) Electricity transmittance cable.

Ecosystem effects

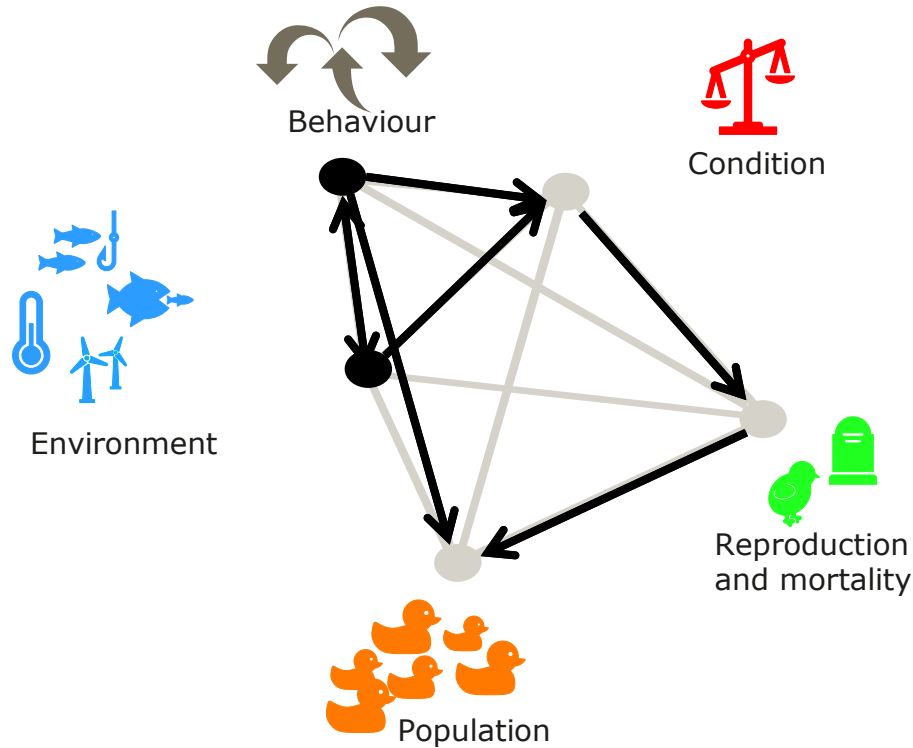


Rezaei et al. 2023, Ocean and coastal management

- (1) Offshore wind farm
- (2) Trenching machine
- (3) Chemical release
- (4) Electromagnetic field
- (5) Noise pollution
- (6) Noise pollution
- (7) Turbidity plume
- (8) Sediment transportation
- (9) Electromagnetic field



Effects on the....



Ecosystem effects

- Offshore wind developments (e.g. turbidity and productivity; WOZEP)
- Climate change (MONS)
- Fisheries changes (MONS)
- To be developed, but links to habitat loss effects model

Cumulative effects

- Combined effects of OWFs (collisions, habitat loss and ecosystem effects; WOZEP)
- Combined effects of the transitions (food, energy and nature; MONS)
- To be developed

Process

- Five-year project: 2025-2029
- Until June 2025: project plan
 - Components (in discussion with RWS and (inter)national experts)
 - Timeline
 - Prioritization
- Habitat loss model developments have started
- KEC 6 in 2026

Questions?



Species collisions and habitat loss assessment

▪ Habitat loss 2024

- Sandwich tern
- Northern gannet
- Common guillemot
- Razorbill

▪ Collisions 2024

- Northern gannet
- Arctic Skua
- Great Skua
- Black-legged kittiwake
- Little gull
- Lesser black-backed gull
- Herring gull
- Great black-backed gull
- Common tern
- Sandwich tern
- Bewick's swan
- Brent goose
- Common shelduck
- Curlew
- Bar-tailed godwit
- Red knot
- Black tern
- Common starling